

CLAIMS

1. Process for the production of an isotropic polymeric network comprising multifunctional molecules with a functionality, n , of at least 5 by contacting in a solvent an amount of the multifunctional molecules with an amount of a coupling agent, whereby through supramolecular chemistry a bond between the multifunctional molecule and the coupling agent is formed.
2. Process according to claim 1 whereby the coupling agent comprises a transition metal and whereby a bond between the multifunctional molecule and the coupling agent is formed through complexation of the transition metal.
3. Process for the production of a isotropic polymeric network according to claim 1, wherein the ratio of the molar amount of the coupling agent to the multifunctional molecule equals $n/2$.
4. Process for the production of an isotropic polymeric network according to any one of claims 1-2, wherein wherein the sum, ρ , of the amounts of the multifunctional molecules and coupling agent per unit of volume, in kg/m^3 , is at least equal to the value as given by expression (I)

$$\frac{a(m_1 + \frac{n}{2}m_2)}{10^{26}(d+L)^3} \quad (I)$$

in which

$a = 0.2$

d = the diameter of the multifunctional molecule, including the length of the bonds to the middle of atoms of the coupling agent to which it is attached.

L = the length of the coupling agent, measured between the middle of the atoms that are connected to the multifunctional molecule.

m_1 = the molecular mass of the multifunctional molecule as present in the isotropic polymeric network

m_2 = the molecular mass of the coupling agent as present in the isotropic polymeric network

n = the functionality of the multifunctional molecule ($n \geq 5$).

5. Isotropic polymeric network comprising multifunctional molecules with a functionality of at least 5 and a coupling agent, whereby through supramolecular chemistry a bond between the multifunctional molecule and the coupling agent is formed, with a specific Young's modulus of at least 0.007 GPa.m³/kg and a density lower than 1300 kg/m³.
6. Isotropic polymeric network according to claim 5, wherein the network is substantially free of cavities comprising a gas.
7. Shaped article comprising the isotropic polymeric network according to any one of claims 5-6.
8. Use of the isotropic polymeric network of any one of claims 5-6 as a construction material.